Operating instructions

MC704-H

with integrated
Powermodul PMT-3

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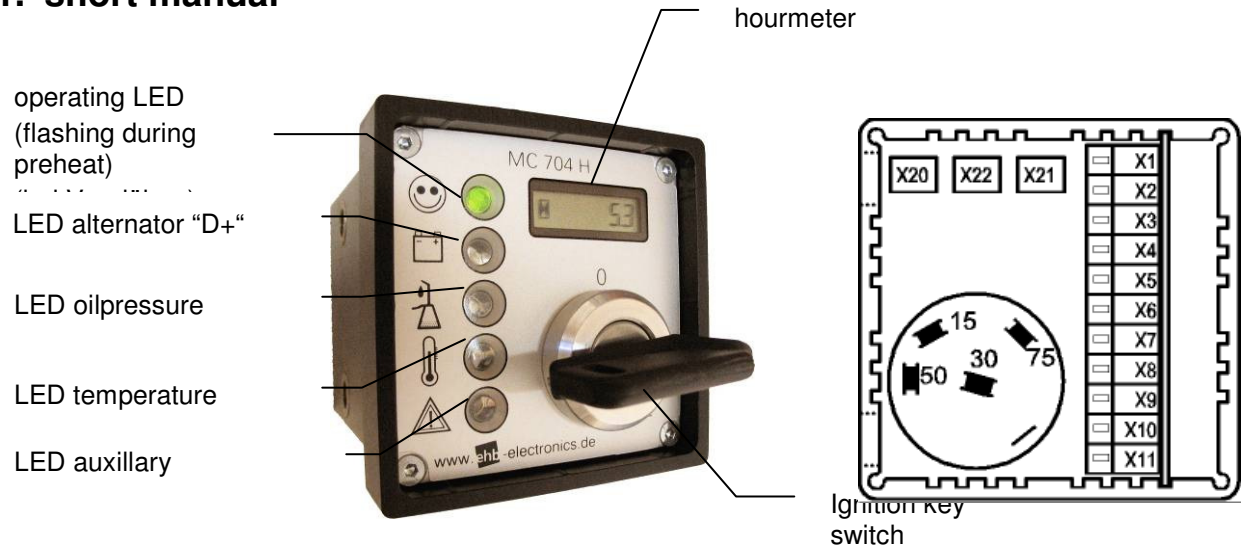
1. short manual



X1	Input oilpressure switch
X2	Input alterantor “D+“
X3	Input temperature switch
X4	Input auxillary switch
X5	Kl.31 ground battery max. 1A
X6	Output holdcoil solonoid max. 3,5A
X7	Output signal max. 3,5A
X8	Output pullcoil solonoid max. 40A (2s 70A)*
X9	Output signal for 20s in case of failure max. 40A (2s 70A)*
X10	External Stop (NO)
X11	Input alternator “W“

X20	Kl.30 Battery + max. 40A (2s 70A)*
X21	Output starter 50f max. 40A (2s 70A)*
X22	Output preheat max. 40A (2s 70A)*
X30	On powermodul for internal connection
X31	On powermodul for internal connection
X32	On powermodul for internal connection
30	Ignition key switch for internal connection
15	Ignition key switch for internal connection
50	Ignition key switch for internal connection
75	Ignition key switch for internal connection

***40A (2s 70A)**

Is the maximum current of the diode for the reserve voltage protection of all outputs together!

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3. general

3.1 introduction

Safety and security of your engines have the top priority in the design of our products. We want to avoid costly repairs, downtime and the associated costs and concerns.
A high standard of quality and good value for money are part of our philosophy. Our outstanding know how is the customized development of solutions for your specific machinery

With the ehb engine monitoring your engine get the best protection. The integrated control system offers various possibilities for the engine control, depending on the model.

The MC 704 monitors four engine parameters, and has a addtional hour meter. The controll inputs are programmed to stop the engine in case of a failure. An ignition key switch is integrated.

The MC 704 is a rugged designed engine monitoring, which you can use for example in construction equipment and power generators.

3.2 Target group

This documentation is aimed at the service staff of equipment where the MC704-H-PMT3 is incorporated.

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3.3 Important instructions for using the device

Use	The device must only be operated using the accessories delivered with it. Cleaning should only be carried out using mild cleaning agents. Please do not introduce any objects that are not suitable for the specified purpose into openings in the device, as this may lead to failures in the electronics. When operating the device, comply with the general accident prevention regulations.
Security	Do not operate the MC704-H-PMT3 within a range of strong electromagnetic fields. Comply with the temperature ranges stated under 8.
Storage	A MC704-H-PMT3 that is not being used may only be stored in accordance with its operating specification.
Dispatch	Whenever it is shipped, the device must always be packed in its original packaging or in comparably robust packaging. Improper packaging of this kind comes under the heading of *Negligence,* which disqualifies the device from repair under warranty.
Maintenance	During its whole service life, the MCflex requires no maintenance and needs no special servicing.
Opening the MC704-h-PMT3	The MC704-H-PMT3 contains no parts that can be maintained, exchanged or repaired by the customer or by anyone other than authorised ehb service staff. The MC704-H-PMT3 is sealed to prevent unauthorised opening. Please note that opening the device will damage it beyond repair.

3.4 Repairing devices

If a repair should become necessary, send the device back to:

ehb electronics GmbH
Hans-Böckler-Str. 20
30851 Langenhagen

Please ensure that a written description of the fault is included with the device. This will greatly assist the ehb electronics gmbh Service Department in identifying the fault, so the MCflex can be more quickly repaired and returned.

NOTE!

Ehb electronics GmbH accepts liability exclusively for the correct execution of the work it performs and for the good quality of the materials used. Any further claims, such as compensation for loss of profits and compensation for direct or indirect consequential losses, such as loss of data, are excluded.

CAUTION!

Damage due to improper packaging of the device for shipping and/or unauthorised opening of the device will invalidate the warranty!

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4. Operating

4.1 Start optimisation

Ignition key switch position 1...all Piktograms are flashing three times (Self test).
During the preheat time the green operation LED is flashing and after more 30 seconds the ETR - soleniod (**E**nergize **T**o **R**un) is aktiv and you can start the engine.
If the engine is not started during this time, the ETR solenoid is getting inactiv to protect the battery.
After starting the green LED is turn on and the status of all inputs is displayed.
You can also start the engine directly, if the ETR solenoid is turned off to protect the battery, without turning the ignition key switch back to position „0“. The output for the ETR solenoid will turn on directly if the ignition key switch is turned in position „2“.

4.2 Failure detection

Vor dem Start zeigen die LED’s den Zustand der Eingänge an.
Die Überwachung der Eingänge beginnt erst 7 Sekunden nach dem Start, um dem Motor die Gelegenheit zu geben Öldruck und Ladespannung aufzubauen.
Ein Fehler an einem abstellenden Eingang (z. B. Motoröldruck) während des Betriebs, führt nach 3 Sekunden zum Abschalten des Ausgangs ETR-Betriebsmagnet und somit zum Abschalten des Motors.
Nur der Eingang der zum Abschalten des Motors geführt hat wird angezeigt. Alle anderen Anzeigen werden unterdrückt. Somit kann einwandfrei festgestellt werden, welcher Fehler ursächlich zum Abschalten des Motors geführt hat.

Before the start the LEDs show the status of the inputs.
The monitoring of the inputs begin until 7 seconds after the start, to give the engine the opportunity to develop charging voltage and oil pressure.
An error on one oft he inputs during operation (for example engine oil pressure) will switch off the output for the ETR solenoid, so that the engine will shut down. Only the led oft he input which was the reason fort he engine shut down is turned on. So that you can easily detect the failure which was the reason oft he engine shut down.

4.3 Prehaet

The preheat is started for a programmed time of 10 seconds, after the ignition key switch is turned in position „1“. The operating LED is blinking during this time. If you turn the ignition key switch in position „2“, the preheat will stop.

4.4 Starter protection

The starter protection prevent the activation oft he starter during the engine is running.
The running engine is detected with the measuring of impulses at input X11 (alternator „W“)
In this case the input 50e oft he ignition key switch is ignored and the output X21, 50f tot he starter stay switch off.

4.5 Hourmeter

The hourmeter start counting if input X2 (alternator D+) measure voltage (the engine is running).

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4.6 Display

1. LED green, OK-LED (Smily) during operation
Blinking during preheat

2. LED red, battery charge indicator. “D+”

3. LED red, oilpressure failure

4. LED red, temperature failure

5. LED red, auxillary failure

4.7 Ignition key switch

The ignition key switch has a mecanical starter protection.

Function of the ignition key switch

Position	meaning
0	Unit is turned off.
1	Ignition is turned on. Preheat starts, ETR solenoid is turned on.
2	**Engine Start with mecanical starter protection**

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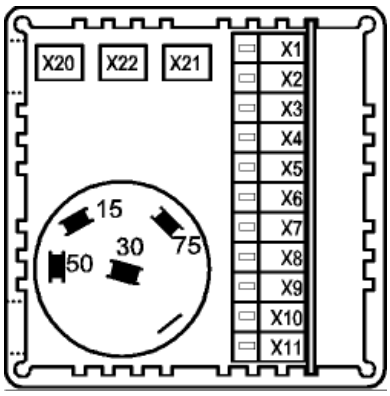
5. Place into operation



Attention!
Please disconnect battery bevor working at the electric device!

5.1 Inputs connection:

- X1 Oilpressureswitch (NC) switch against ground, shut down
- X2 alternator clamp "D+" connection "L"

GND = alternator/engine is not running, shut down
+12V = altenator/engine is running

- X3 Temperatureswitch (NO) switch against ground, shut down
- X4 auxillary switch (NO) switch against ground, shut down
- X10 External Stop (NO) switch against ground, shut down
- X11 alternator clamp "W"

Impulse = engine is running, starter protection
no impulse = engine is not running, engine can be started

- X20 clamp 30 Battery + max. 40A (2s 70A)*
- X5 clamp 31 Battery –
- X30 ignition key switch clamp 30 at Powermodul PMT-3
- X31 ignition key switch clamp at Powermodul PMT-3
- X32 ignition key switch clamp 15 at Powermodul PMT-3

5.2 Output connection:

- X6 ETR-solenoid holdcoil max. 3,5A
- X8 ETR- solenoid pullcoil max. 40A (2s 70A)*

- X7 Signal, max. 3,5A
- X9 Signal for 20s activ , max. 40A (2s 70A)*

- X22 Preheat, max. 40A (2s 70A)*
- X21 Output start 50f, max. 40A (2s 70A)*

***40A (2s 70A)**
Is the maximum current of the diode for the reserve voltage protection of all outputs together!

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5.3 Assembly and connection

Attach the device to the U-bolt in a square hole 66x66 mm, or with the threaded sockets on a flange.

Please connect the wiring harness connectors with the connectors oft he MC704-H-PMT3. The connectors for the emergency stop are optional, connect your emergency stop if necessary

Do you need to refit a temperature switch, mount it with water-cooled engines in the water cycle (warm side) and in the air-cooled engine cylinder head. For combined sensor / switches, connect the large connector (6.3 mm) with the temperature instrument, the small port (4.8 mm) X3 with the temperature switch input.

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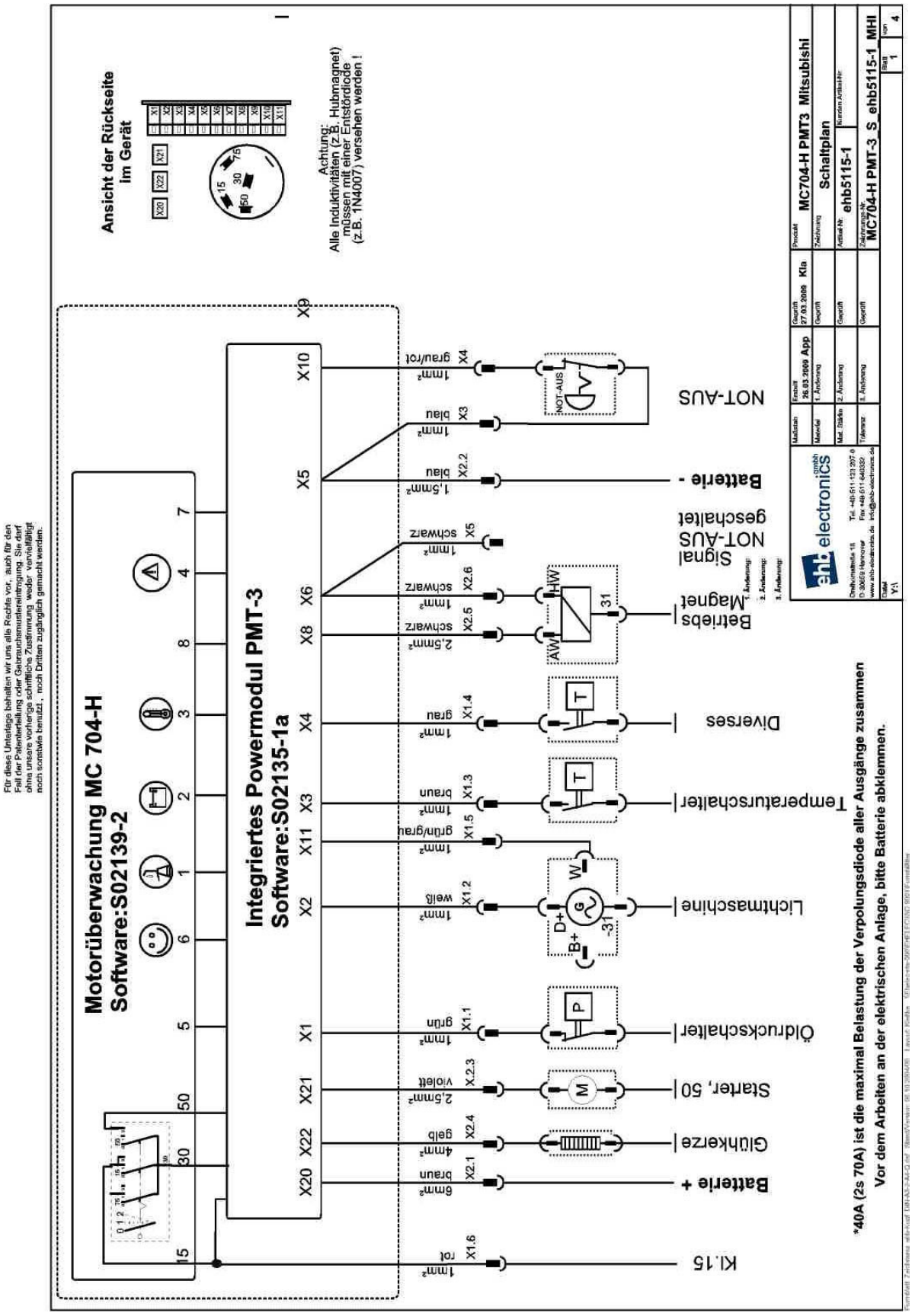
6. Wiring diagram



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Technical Data

Parameter	condition	Critical value			note
		min.	typ	max.	
Voltage UB		6V	12...24V	32V	
Interference voltage - UB	6Vss, 50Hz	14V		28V	
Voltage peaks - UB	2ms		200V		
Operating current 8-24 V UB 8-24V	ignition on/off	**< 1mA**		200mA	The operating current can change during operation, depend on condition oft he outputs.
Digital outputs aktiv High X2 clamp “D+“ X6 Solenoid HC X7 Signal X8 Solenoid PC X9 Signal 20s X21 Start 50f X22 Preheat	TA 25°C		0,5A 3,5A 3,5A 40A 40A 40A 40A	0,5A 4A* 4A* 70A* 70A* 70A* 70A*	Short circuit proof *max 2s
Digital inputs aktiv Low X1 Oilpressureswitch X2 alternotor “D+“ X3 Temperatureswitch X4 auxillary X10 External. Stop (emergency stop) X11 alternator ”W“	TA 25°C	5Vss		5V 5V 5V 5V 1,5V	Low – Pegelerkennung Offset 2,5V
Digital inputs aktiv High X32 ignition key switch clamp15 X31 ignition key switch clamp 50	TA 25°C	3,5V 3,5V			High – Pegelerkennung
Operating temperature Storrage temperature		-40°C -55°C		+85°C +105°C	
Feuchtigkeit (nicht kondensierend)	48h		95%		Nach SAE J1378
Humidity	6h, 10-80Hz		20g		Nach SAE J1378
Shock	72x, 9-13ms	44g		55g	Nach SAE J1378
Protection class		IP54			

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7. Dokumentinformationen und Historie

Produkt:	MC704-H mit PMT-3
Dokumentenart:	Technische Dokumentation
Version:	1.1
Erstellt am:	24.06.2008
Autor:	Klettke ehb-electronics GmbH, Hannover

Änderungen:

Version:	Bearbeitung:	am:	von:
1.0	Erstellung	24.06.2008	Kle
1.1	Technische Daten angepasst	02.03.2010	Kle
1.2	Übersetzung englisch	22.06.2010	App

7.1 Impressum

Messen – Steuern – Regeln

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